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ADDENDUM NO.02 to the plans and specifications for the Macomb County Clemens Center, County Clerk Storage Renovations, Mt. Clemens, MI, Architect's Project No. 231987, dated July 25, 2024.

The above plans and specifications are modified, supplemented or augmented as follows, and this ADDENDUM NO. 02, is hereby made a part of the contract documents.

**Spec Section 212200 is being issued with this Addendum.**

**FIRE SUPPRESSION SPECIFICATION ITEMS:**

**ITEM NO. FS1**: See attached Revised Spec Section 212200-Clean Agent Fire-Extinguishing System.(Issued)
1. See attached Section.

**END OF ADDENDUM NO. 02**

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# SECTION 212200
# CLEAN-AGENT FIRE-EXTINGUISHING SYSTEM

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Fire suppression system control panel.

B. Space or area signage.

C. System piping and specialties.

D. Clean-agent containers.

E. Agent discharge nozzles.

### 1.02 RELATED REQUIREMENTS

A. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.

### 1.03 REFERENCE STANDARDS

A. ASHRAE Std 135 - A Data Communication Protocol for Building Automation and Control Networks; 2020, with Addendum (2024).

B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2018.

C. ASTM A106/A106M - Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service; 2019a.

D. ASTM A135/A135M - Standard Specification for Electric-Resistance-Welded Steel Pipe; 2021.

E. ITS (DIR) - Directory of Listed Products; Current Edition.

F. NEMA ICS 6 - Industrial Control and Systems: Enclosures; 1993 (Reaffirmed 2016).

G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. NFPA 72 - National Fire Alarm and Signaling Code; Most Recent Edition Cited by Referring Code or Reference Standard.

I. UL (DIR) - Online Certifications Directory; Current Edition.

### 1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Design Data: Submit design calculations stamp of approval from Authority Having Jurisdiction. Include calculated system pressures, nozzle flow rate, orifice code numbers, piping pressure losses, component flow data, and pipe sizes.

C. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

### 1.05 QUALITY ASSURANCE

A. Designer Qualifications: Perform design under direct supervision of a Professional Engineer experienced in design of this work and licensed in the State in which the Project is located.

### 1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store equipment in shipping containers with labeling in place. Deliver fire extinguishing agent in approved containers.

### 1.07 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Provide two year system warranty for complete replacement fire extinguishing agent.

## PART 2 PRODUCTS

### 2.01 CLEAN-AGENT FIRE SUPPRESSION SYSTEM REQUIREMENTS

A. Engineered fire detection and suppression system that totally floods protected area with clean-agent fire extinguishing agent to extinguish fire.
   1. Locate extinguishing agent supply and backup supply in each protected area.
   2. Locate manual release stations at each exit from protected area.
   3. Locate abort stations at each exit from protected area.
   4. Provide all manufactured system components from a single source and by a single manufacturer.
   5. Provide components listed and labeled by ITS (DIR) or UL (DIR) for the type of system required and for use with the other components of the system.

B. Engineered System Design Criteria:
   1. Provide total flooding of fire extinguishing agent at manufacturer's recommended concentration by volume and initiated within 10 of automated fire detection or immediately upon manual station operation, supplied continuously for 10 minutes with 10 percent allowance for room leakage.
   2. Direct discharge parallel to ceiling; use 360 degree pattern nozzles except where obstructions would make 360 distribution inefficient.
   3. Provide sufficient amount of fire extinguishing agent. Consider the following when computing volume:
      a. Volume of protected area.
      b. Specific volume of fire extinguishing agent.
      c. Additional quantities of fire extinguishing agent required to compensate for openings, pipe losses.
      d. Other special conditions affecting extinguishing agent concentration.

### 2.02 FIRE SUPPRESSION SYSTEM CONTROL PANEL

A. Provide system controller in the form of fire alarm system monitored, self-contained control panel or module.

B. Type: Combination type approved as both alarm and releasing device, with solid state internal circuitry enclosed in NEMA ICS 6, Type 1 cabinet.

C. Provide NFPA 72, Class A circuit supervision for wire break or ground faults of:
   1. Zone detection loops.
   2. Suppression system solenoid valves.
   3. Power supply and circuit wiring and fuse.
   4. Battery interconnecting wires and fuse.
   5. Alarm in abort mode.

D. Conceal control switches and indicators, with exception of Power On, Master Trouble, Supervisory Trouble, Circuit 1 Alarm, Circuit 2 Alarm and Release Indicators.

E. Equip panel with following standard features:
   1. Visual and audible annunciation of trouble or alarm signals.
   2. Panel reset switch.
   3. Trouble alarm silence switch with ring back feature.
   4. Battery test meter and switch.

5. Manual discharge switch.
6. Deadman abort switch.
7. Programmable timers for pre-discharge and discharge, 0 to 60 second cycle.
8. Isolated relay contactors for external alarm or equipment and ventilation shutdown.
9. Relay contactors for general trouble signal.
10. Relay contactor activated by detector zone board in alarm or trouble mode.

F. Annunciation: Provide the following annunciation:
1. Power On: Green.
2. System Trouble: Amber.
3. Battery Trouble: Amber.
4. Ground Fault: Amber.
5. Release trouble: Amber.
6. Agent Release: Red.
7. Alarm Output Trouble: Amber.
8. Supervisory Trouble: Amber.

G. Batteries: Provide nickel cadmium batteries and charger for continuous operation of detection, alarm, actuation and supervision functions for 24 hours. Provide automatic battery switch-over upon failure of primary power supply.

H. BAS, BMS, SCADA, or other Integrated Automation Link: ASHRAE Std 135 BACnet IP.

I. Initiating Devices:
1. Manual Pull Stations:
a. Semi-flush housing fitted with double action control fitted with "push in" tab and "pull down" lever that locks in position after releasing spring-loaded contact switch, for mounting on electrical outlet box; addressable using manufacturer's standard monitor module.
1) Activate all audible and visual alarms.
2) Override any abort station or time delay function.
3) Activate all release and shutdown functions normally triggered by detectors or alarm system.
4) Engraved Sign or Label: Provide adjacent to each manual release station indicating area protected and that actuation will cause discharge of fire extinguishing agent.
2. Manual System Abort Switch:
a. Stainless steel plate with momentary contact push button, countdown timer, magnetic door holders manual release, for mounting on electrical outlet box; addressable using manufacturer's standard monitor module.
b. Engraved Sign or Label: Provide adjacent to each manual abort station, indicating area protected and that actuation will prevent discharge of fire extinguishing agent after automatic system is activated.

J. Notification and Control Devices:
1. Alarm Bells: 24 VDC with supervision of circuit wiring, of modular design, red baked enamel finish, with minimum sound level of 84 dba at 10 feet (3 m), for mounting on 4 inch (100 mm) electrical outlet box.
2. Alarm Horns: 24 VDC with supervision of circuit wiring, with minimum sound level of 90 dba at 10 feet (3 meters), for mounting on 4 inch (100 mm) electrical outlet box.
3. Strobe Beacon: 24 VDC with system identification on strobe lens.

K. Fire-Suppression Operating Sequence:

1. Actuation of one detector in either zone circuit:
   a. Illuminate zone indicator.
   b. Energize alarm bell.
   c. Shut down air-conditioning system and close dampers.
   d. Close doors to area.
   e. Signal building fire alarm system.
2. Actuation of second detector on second zone circuit:
   a. Illuminate zone indicator.
   b. Energize alarm horn.
   c. Shut down power to protected equipment.
   d. Actuate time delay for up to 30 seconds.
   e. Release extinguishing agent into protected area.
   f. If abort switch is engaged, delay release.
   g. Upon abort switch disengagement release extinguishing agent unless system cleared and reset.
3. Discharge of Extinguishing Agent:
   a. Sounds alarm bells and horns.
   b. Operates strobes.

**2.03 SYSTEM PIPING AND SPECIALTIES**

A. Steel Pipe: ASTM A53/A53M or ASTM A106/A106M Schedule 40, or ASTM A135/A135M Schedule 10, galvanized as specified in ASTM A53/A53M.

**2.04 CLEAN-AGENT CONTAINERS**

A. Containers:
   1. Where multiple, replaceable containers are used, provide only containers of the same size and holding the same amount of extinguishing agent.

B. Contents: Fill with required fire extinguishing agent.

**2.05 AGENT DISCHARGE NOZZLES**

A. Nozzles: UL (DIR) listed; orifice size providing required rates of discharge and coverage and to distribute extinguishing agent uniformly throughout protected area.

B. Construction: Two-piece chrome plated brass or aluminum nozzle with textured finish with female pipe thread integral on body; one-piece deflector plate.

C. Identification: Permanently mark nozzles with manufacturer's part number, UL listing and equivalent single orifice diameter.

**PART 3 EXECUTION**

**3.01 INSTALLATION**

A. Route piping in orderly manner, concealed, plumb and parallel to building structure, and maintain gradient. Install piping to conserve building space, and not interfere with use of space and other work.

B. Identify in accordance with requirements of referenced standard.

C. In rooms with suspended ceiling tiles, clip or retain tiles within 4 foot (1.2 m) radius of the nozzles to prevent lifting during discharge.

D. Install wiring in compliance with NFPA 70, see Section 260583.

**3.02 FIELD QUALITY CONTROL**

A. Perform field inspection and testing in accordance with Section 014000 - Quality Requirements.

B. Test distribution piping and valving, prior to nozzle installation, to 50 psi (340 kPa) air pressure test. Inspect joints using soap water solution or halide torch or lamp. Repair leaks and retest. Maintain test pressure for four hours.

C. Upon completion of installation provide final checkout inspection by factory trained representative of manufacturer to ascertain proper system operation. Leave system in a fully commissioned and automatic readiness state with circuitry energized and supervised.

D. Test circuits including automatic discharge, manual discharge, equipment shut-down, alarm devices, and storage container pressure. Test supervision of each circuit.

E. Check each ionization detector with a sensitivity meter, adjust. Record sensitivity, and include record in test report.

F. Submit original copies of tests, indicating that factory trained technical representatives of the manufacturer have inspected and tested systems and are satisfied with methods of installation, connections and operation.

G. Pressure test entire enclosure with test fan, pressurizing protected area both under positive and negative conditions. Confirm that leakage is within system design allowance.